IN THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application.

1. (currently amended) A device, comprising:

an integrated circuit chip; and

enclosed channels to carry a liquid coolant that are proximate to a surface of the integrated circuit chip and that extend along a length of the integrated circuit chip,

wherein a density of the channels changes abruptly at least once across the length of the integrated circuit chip or across a width of the integrated circuit chip.

2. (original) The device of claim 1, wherein the channels are formed in the integrated circuit chip and substantially under the surface of the integrated circuit chip.

3. (original) The device of claim 1, further comprising:

a heat exchange layer over the integrated circuit chip,

wherein the channels are formed in the heat exchange layer.

4. (original) The device of claim 3, further comprising:

a cap on the heat exchange layer to at least partially define the channels.

5. (original) The device of claim 3, further comprising:

an interface layer between the integrated circuit chip and the heat exchange layer.

6. (original) The device of claim 1, wherein the channels include:

a first area having a first channel density, and

a second area adjacent to the first area and having a second channel density that is lower than the first channel density.

7. (original) The device of claim 6, wherein at least one of the first and second areas span a full width of the integrated circuit chip.

8. (original) The device of claim 6, wherein the channels further include:

a third area adjacent to the second area having a third channel density that is different than the second channel density.

9. (original) The device of claim 6, wherein the channels are longitudinally offset at least once within the first area.

10. (currently amended) A device, comprising:

a semiconductor base including an area of higher power density and an area of lower power density; and

a heat exchange layer over the semiconductor base and including enclosed channels formed therein suitable for carrying liquid coolant,

wherein a density of the enclosed channels over the area of higher power density is higher than a density of the enclosed channels over the area of lower power density.

11. (original) The device of claim 10, further comprising:

a thermal interface layer between the semiconductor base and the heat exchange layer.

12. (original) The device of claim 10, further comprising:

a plate on the heat exchange layer to at least partially define the channels.

13. (original) The device of claim 10, wherein a ratio of the density of the channels over the area of higher power density to the density of the channels over the area of lower power density is greater than about 1.1.

14. (original) The device of claim 10, wherein the channels over the area of higher power density include at least two staggered segments.

15. (original) The device of claim 10, wherein the semiconductor base includes an area having an intermediate power density that is between the higher power density and the lower power density, and

wherein a density of the channels over the area having the intermediate power density is higher than the density of the channels over the area of lower power density and is lower than the density of the channels over the area of higher power density.

16. (original) The device of claim 10, further comprising:

an upper heat exchange layer over the heat exchange layer and including upper channels formed therein suitable for carrying coolant.

17. (original) The device of claim 16, wherein a density of the upper channels over the area of higher power density is higher than a density of the upper channels over the area of lower power density.

18. (original) The device of claim 16, wherein a direction of the channels in the heat exchange layer is substantially orthogonal to a direction of the upper channels in the upper heat exchange layer.

19. (original) A device, comprising:

an integrated circuit chip including channels in a surface thereof; and

a cap connected to the integrated circuit chip to define a top of the channels,

wherein an average width of the channels substantially changes at least once along a length of the channels.

20. (original) The device of claim 19, wherein the channels include one area of higher average width and a different area of lower average width, and

wherein a ratio of the higher average width to the lower average width is less than about 8.

21. (original) The device of claim 19, wherein the channels include one area of higher average width and a different area of lower average width, and

wherein the channels within the area of lower average width include at least one discontinuity.

22. (original) The device of claim 19, wherein an average width of the channels substantially changes at least twice along a length of the channels.

23. (original) The device of claim 19, further comprising:

a heat exchange layer over the cap and including upper channels formed therein suitable for carrying coolant,

wherein an average width of the upper channels substantially changes at least once along a length of the upper channels.

24. (original) The device of claim 23, wherein a direction of the length of the channels in the integrated circuit chip is substantially orthogonal to a direction of the length of the upper channels in the heat exchange layer.

25. (currently amended) A system, comprising:

a semiconductor device including enclosed arteries therein suitable for carrying liquid coolant through the semiconductor device, a density of the enclosed arteries across a first portion of the semiconductor device being greater than a density of the enclosed arteries across a second portion of the semiconductor device; and

a fan to assist in dissipating heat from the semiconductor device.

26. (original) The system of claim 25, wherein the density of the arteries across the first portion of the semiconductor device is at least 1.1 times the density of the arteries across the second portion of the semiconductor device.

27. (original) A method, comprising:

forming first channels in a layer of a semiconductor device;

forming second channels in the layer of a semiconductor device adjacent to the first channels and in a same direction as the first channels, the second channels having a greater average width than the first channels; and

capping the first and second channels to form a channel structure suitable for carrying liquid coolant through the semiconductor device.

28. (original) The method of claim 27, wherein the layer of the semiconductor device includes copper, aluminum, or silicon.

29. (original) A device, comprising:

an integrated circuit chip; and

channels to carry a coolant that are proximate to a surface of the integrated circuit chip and that extend along a length of the integrated circuit chip,

wherein the channels are longitudinally offset at least once along the length of the integrated circuit chip.

30. (original) The device of claim 29, wherein the channels are longitudinally offset at least twice along the length of the integrated circuit chip.

31. (original) The device of claim 29, wherein the channels have a substantially uniform density along the length of the integrated circuit chip.